



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of: **OHASHI, Hitoshi et al.**

Group Art Unit:1792

Serial No.: 10/047,992

Examiner: **TALBOT, Brian K.**

Filed: **January 17, 2002**

P.T.O. Confirmation No.: 5363

For: **METHOD AND APPARATUS FOR FORMING ELECTRIC CIRCUIT FIXING
THE
SEMICONDUCTOR DEVICE USING SUBSTRATE JIG**

SUBMISSION OF SUBSTITUTE APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

November 12, 2008

Sir:

Submitted herewith is a Substitute Appeal Brief in the above-identified U.S. patent application.

In the event that any fees are due with respect to this paper, please charge Deposit Account No. 01-2340.

Respectfully submitted,
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PATENT & TRADEMARK OFFICE

Enclosure: Substitute Appeal Brief



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

SUBSTITUTE APPEAL BRIEF FOR THE APPELLANTS

OHASHI, Hitoshi, et al.

**METHOD AND APPARATUS FOR FORMING ELECTRIC CIRCUIT FIXING THE
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PATENT & TRADEMARK OFFICE

Date: November 12, 2008
Atty. Docket No. **020052**



THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appeal No:

In re the Application of: **OHASHI, Hitoshi et al.**

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For: **METHOD AND APPARATUS FOR FORMING ELECTRIC CIRCUIT
FIXING THE SEMICONDUCTOR DEVICE USING SUBSTRATE JIG**

SUBSTITUTE BRIEF ON APPEAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Date: November 12, 2008

Sir:

This is an appeal from the Office Action dated January 1, 2008.

A Response Under 37 CFR §1.116 was filed on April 8, 2008.

An Advisory Action was mailed on April 25, 2008.

A Notice of Appeal was filed on June 9, 2008.

An Appeal Brief was filed on August 11, 2008. A Notification of Non-Compliant Appeal Brief was mailed on November 5, 2008. That Notification indicated that the "Status of Claims" Statement on page 5 of the original Appeal Brief was incomplete. Accordingly, this Substitute Appeal Brief is being submitted on November 12, 2008 with a revised "Status of Claims" Statement on page 5. This Substitute Appeal Brief replaces the original Appeal Brief that was filed on August 11, 2008.

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I. REAL PARTY IN INTEREST

The real party in interest is the assignee of the subject application, which is:

Yazaki Corporation
4-28, Mita 1-chome
Minato-ku, Tokyo 108-0073, Japan

II. RELATED APPEALS AND INTERFERENCES

Appellants know of no other prior appeals, pending appeals, interferences, or judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

* * * *

III. STATUS OF CLAIMS

Claims 1, 7, 8, 11, 17, 18, and 51-56 have been rejected and are the subject of this appeal.

Claims 2-6, 9, 10, 12-16, and 19-50 have been canceled.

* * * *

IV. STATUS OF AMENDMENTS

All amendments have been entered.

In the Advisory Action dated April 25, 2008, the Examiner states that: "For purposes of appeal, the proposed amendment(s) ... [in the Response filed April 8, 2008] will be entered."

* * * *

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Claim 1 on appeal recites a method for forming an electric circuit (*see element 10 in Figure 1 for one example of an electric circuit; see also the specification, page 45, lines 15-17*) on a construction member (*see element 2 in Figure 1 for one example of a construction member; see also the specification, page 45, lines 15-17*) disposed on a machine (*see element 1 in Figure 18 for one example of a machine; see also the specification, page 45, lines 15-17*) based on a set of three-dimensional data (*see set of three-dimensional data **D1** in the specification from page 52 at line 3 to page 53 at line 2 for one example of a set of three-dimensional data*), the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,

wherein the data is associated with a reference coordinate system (*see reference coordinate system **Ca** with three-dimensional data **XaYaZa** in the specification from page 52 at line 25 to page 53 at line 3 for one example of a reference coordinate system; see also Figure 18*) provided in the machine, the origin of the coordinate system being located at any position of the machine (*see the specification, page 53, lines 2-4, for one example of a coordinate system being located at any position of a machine*), and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,

the method comprising the step of converting the data of the coordinate system having the origin located at any position of the machine to a second set of three-dimensional data (*see second set of three-dimensional data **D2** in the specification from page 53 at line 13 to page 54 at line 4 for one example of a second set of three-dimensional data; see also Figure 3*) associated with a reference coordinate system (*see reference coordinate system **Cb** with three-dimensional data **XbYbZb** in the specification from page 53 at line 13 to page 54 at line 4 for one example of a reference coordinate system; see also Figure 2*) provided in the construction member disposed on a transfer unit (*see element 27 in Figure 12 for one example of a transfer unit; see also the specification, page 55, lines 15-19*) and having the origin in the construction member,

the method further comprising the step of intermittently jetting a molten metal (*see element **K** in Figure 5 for one example of a molten metal; see also the specification, page 54, lines 9-23*) against the construction member to define rows of metal grains (*see Figure 7 for one example of a row of metal grains; see also the specification, page 55, lines 19-22*) so as to deposit the molten metal on a surface of the construction member (*see element 2a in Figure 7 for one example of a surface of the construction member; see also the specification, page 55, lines 19-22*) to form the electric circuit on the construction member based on the second set of three-dimensional data,

wherein the deposited metal grains overlap one another such that the electric circuit has the cross-sectional area stored in the second set of data between the two points, and

wherein the molten metal is jetted from a nozzle (*see element 25 in Figure 5 for one example of a nozzle; see also the specification, page 54, lines 9-15*) and both the nozzle and the construction member have X, Y, Z axes perpendicular to each other, the nozzle being movable along each of the X, Y, Z axes, the nozzle moving in a circumferential direction around each of the X axis and the Y axis, and the construction member being movable along each of the X, Y, Z axes and also in a circumferential direction around each of the X, Y, Z axes.

Claim 11 on appeal recites a method for forming an electric circuit (*see element 10 in Figure 1 for one example of an electric circuit; see also the specification, page 45, lines 15-17*) on an insulating intermediate member (*see element 31 in Figure 10 for one example of an insulating intermediate member; see also the specification, page 60, lines 24-28*) laid on a construction member (*see element 2 in Figure 1 for one example of a construction member; see also the specification, page 45, lines 15-17*) disposed on a machine (*see element 1 in Figure 18 for one example of a machine; see also the specification, page 45, lines 15-17*) based on a set of three-dimensional data (*see set of three-dimensional data D1 in the specification from page 52 at line 3 to page 53 at line 2 for one example of a set of three-dimensional data*), the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,

wherein the data is associated with a reference coordinate system (*see reference coordinate system Ca with three-dimensional data XaYaZa in the specification from page 52 at line 25 to page 53 at line 3 for one example of a reference coordinate system; see also Figure 18*) provided in the machine, the origin of the coordinate system being located at any position of the

machine (*see the specification, page 53, lines 2-4, for one example of a coordinate system being located at any position of a machine*), and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,

the method comprising the step of converting the data of the coordinate system having the origin located at any position of the machine to a second set of three-dimensional data (*see second set of three-dimensional data **D2** in the specification from page 53 at line 13 to page 54 at line 4 for one example of a second set of three-dimensional data; see also Figure 3*) associated with a reference coordinate system (*see reference coordinate system **Cb** with three-dimensional data **XbYbZb** in the specification from page 53 at line 13 to page 54 at line 4 for one example of a reference coordinate system; see also Figure 2*) provided in the construction member or on the intermediate member disposed on a transfer unit (*see element 27 in Figure 12 for one example of a transfer unit; see also the specification, page 55, lines 15-19*) and having the origin in the member provided,

the method comprising the step of intermittently jetting a molten metal (*see element **K** in Figure 5 for one example of a molten metal; see also the specification, page 54, lines 9-23*) against the construction member to define rows of metal grains (*see Figure 7 for one example of a row of metal grains; see also the specification, page 55, lines 19-22*) so as to deposit the molten metal on a surface of the intermediate member (*see element 31a in Figure 10 for one example of a surface of the intermediate member; see also the specification, page 61, lines 9-14*) to form the electric circuit on the surface of the intermediate member based on the second set of three-dimensional data,

wherein the deposited metal grains overlap one another such that the electric circuit has

the cross-sectional area stored in the second set of data between the two points, and

wherein the molten metal is jetted from a nozzle (*see element 25 in Figure 5 for one example of a nozzle; see also the specification, page 54, lines 9-15*) and both the nozzle and the construction member have X, Y, Z axes perpendicular to each other, the nozzle being movable along each of the X, Y, Z axes, the nozzle moving in a circumferential direction around each of the X axis and the Y axis, and the construction member being movable along each of the X, Y, Z axes and also in a circumferential direction around each of the X, Y, Z axes.

* * * *

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1 and 11 stand rejected under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 5,746,844 (**Sterett et al.**) in view of U.S. Patent No. 4,656,048 (**Kudoh et al.**) and U.S. Patent No. 6,309,711 (**Tseng et al.**).

Claims 1 and 11 stand rejected under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 6,520,402 (**Orme-Marmerilis et al.**) or Japanese Patent No. 10-266803 (**Yamaguchi**) in view of U.S. Patent No. 4,656,048 (**Kudoh et al.**) and U.S. Patent No. 6,309,711 (**Tseng et al.**).

Claims 7, 8, 17, and 18 stand rejected under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 6,520,402 (**Orme-Marmerilis et al.**), U.S. Patent No. 5,746,844 (**Sterett et al.**), or Japanese Patent No. 10-266803 (**Yamaguchi**) in view of U.S. Patent No. 4,656,048 (**Kudoh et al.**), U.S. Patent No. 6,309,711 (**Tseng et al.**), and U.S. Patent No. 6,501,663 (**Pan**).

Claims 51-56 stand rejected under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 6,520,402 (**Orme-Marmerilis et al.**), U.S. Patent No. 5,746,844 (**Sterett et al.**) or Japanese Patent No. 10-266803 (**Yamaguchi**) in view of U.S. Patent No. 4,656,048 (**Kudoh et al.**), U.S. Patent No. 6,309,711 (**Tseng et al.**), and Japanese Patent No. 11-40937 (**Kuwahara et al.**).

* * * *

VII. ARGUMENT

Kudoh et al. measures the surface irregularities of the substrate 18 mounted on the work bench 12 (FIG. 12), which is driven by a X-axis and a Y-axis motor, with the laser beam emitting from a predetermined position (col. 3, lines 60-67) at the laser head 13. Then, the substrate 18 is moved to be positioned under the drawing head 14. The drawing head 14 is then controlled to keep the distance thereof from the substrate 18 (19) including the surface irregularities, constant (col. 4, lines 1-5) with the distance information signal.

In **Kudoh et al.**, it is apparent that the positions (coordinates of X and Y) of the surface irregularities should be the same even when the substrate 18 is moved under the drawing head 14 to draw the circuit. When the positions of the surface irregularities are changed, drawing of the circuit on the substrate cannot be successfully achieved.

In **Kudoh et al.**, the detected distances (coordinate of Z) are only transformed so that the nozzle 7 ejects the drawing paste while the slit opening 8 (the drawing head 14) is kept the distance constant from the substrate (including the irregularities). Accordingly, **Kudoh et al.** only converts the coordinate Z to, for example Z': that is, from XYZ to XYZ'.

However, the features disclosed by the subject application convert a set of three-dimensional data (XaYaZa, FIG. 18) to a second set of three-dimensional data (XbYbZb, FIG. 3).

A. The Examiner has rejected claims 1 and 11 under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 5,746,844 (Sterett et al.) in view of U.S. Patent No. 4,656,048 (Kudoh et al.) and U.S. Patent No. 6,309,711 (Tseng et al.).

Appellants respectfully traverse this rejection, for the following reasons.

There are substantial, important differences between the art relied upon by the Examiner and the features set forth in the claims in issue.

Sterett et al. and **Tseng et al.** fail to remedy the above-discussed deficiencies of **Kudoh et al.**

Sterett et al., **Kudoh et al.**, and **Tseng et al.**, alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 1: "converting the data of the coordinate system having the origin located at any position of the machine to a second set of three-dimensional data associated with a reference coordinate system provided in the construction member disposed on a transfer unit and having the origin in the construction member," in combination with the other claimed features.

Sterett et al., Kudoh et al., and Tseng et al., alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 1: "intermittently jetting a molten metal against the construction member to define rows of metal grains so as to deposit the molten metal on a surface of the construction member to form the electric circuit on the construction member based on the second set of three-dimensional data," in combination with the other claimed features.

Sterett et al., Kudoh et al., and Tseng et al., alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 11: "converting the data of the coordinate system having the origin located at any position of the machine to a second set of three-dimensional data associated with a reference coordinate system provided in the construction member or on the intermediate member disposed on a transfer unit and having the origin in the member provided," in combination with the other claimed features.

Sterett et al., Kudoh et al., and Tseng et al., alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 11: "intermittently jetting a molten metal against the construction member to define rows of metal grains so as to deposit the molten metal on a surface of the intermediate member to form the electric circuit on the surface of the intermediate member based on the second set of three-dimensional data," in combination with the other claimed features.

Appellants submit that it would not have been obvious to combine/modify the art as suggested by the Examiner to attempt to arrive at the features set forth in **claims 1 and 11**.

The Examiner has not yet established a *prima facie* case of obviousness. But it is the burden of the Examiner to do so. The U.S. Patent and Trademark Office has the burden of proof to show that an applicant is not entitled to a patent if the claimed subject matter is anticipated by, or is obvious from, the art of record. A patent applicant is entitled to a patent "unless" the U.S. Patent and Trademark Office establishes otherwise. See, e.g., *In re Dembiczak*, 175 F.3d 994, 1001 (Fed. Cir. 1999); *In re Epstein*, 32 F.3d 1559, 1564 (Fed. Cir. 1994); *In re Rijckeart*, 9 F.3d 1551, 1552 (Fed. Cir. 1992); *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988).

In view of the foregoing remarks, it is respectfully believed that essential elements of a *prima facie* case of obviousness are missing.

Accordingly, Appellants respectfully submit that this rejection of **claims 1 and 11** should be withdrawn.

B. The Examiner has rejected claims 1 and 11 under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 6,520,402 (Orme-Marmerilis et al.) or Japanese Patent No. 10-266803 (Yamaguchi) in view of U.S. Patent No. 4,656,048 (Kudoh et al.) and U.S. Patent No. 6,309,711 (Tseng et al.).

Appellants respectfully traverse this rejection, for the following reasons.

There are substantial, important differences between the art relied upon by the Examiner and the features set forth in the claims in issue.

Orme-Marmerilis et al., Yamaguchi, and Tseng et al. fail to remedy the above-discussed deficiencies of **Kudoh et al.**

Orme-Marmerilis et al., Yamaguchi, Kudoh et al., and Tseng et al., alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 1: "converting the data of the coordinate system having the origin located at any position of the machine to a second set of three-dimensional data associated with a reference coordinate system provided in the construction member disposed on a transfer unit and having the origin in the construction member," in combination with the other claimed features.

Orme-Marmerilis et al., Yamaguchi, Kudoh et al., and Tseng et al., alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 1: "intermittently jetting a molten metal against the construction member to define rows of metal grains so as to deposit the molten metal on a surface of the construction member to form the electric circuit on the construction member based on the second set of three-dimensional data," in combination with the other claimed features.

Orme-Marmerilis et al., Yamaguchi, Kudoh et al., and Tseng et al., alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 11:

"converting the data of the coordinate system having the origin located at any position of the machine to a second set of three-dimensional data associated with a reference coordinate system provided in the construction member or on the intermediate member disposed on a transfer unit and having the origin in the member provided," in combination with the other claimed features.

Orme-Marmerilis et al., Yamaguchi, Kudoh et al., and Tseng et al., alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 11: "intermittently jetting a molten metal against the construction member to define rows of metal grains so as to deposit the molten metal on a surface of the intermediate member to form the electric circuit on the surface of the intermediate member based on the second set of three-dimensional data," in combination with the other claimed features.

Appellants submit that it would not have been obvious to combine/modify the art as suggested by the Examiner to attempt to arrive at the features set forth in **claims 1 and 11**. Essential elements of a *prima facie* case of obviousness are missing.

Accordingly, in view of the above, Appellants respectfully submit that this rejection of **claims 1 and 11** should be withdrawn.

C. The Examiner has rejected claims 7, 8, 17, and 18 under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 6,520,402 (Orme-Marmerilis et al.), U.S. Patent No. 5,746,844 (Sterett et al.), or Japanese Patent No. 10-266803 (Yamaguchi) in view of U.S. Patent

No. 4,656,048 (Kudoh et al.), U.S. Patent No. 6,309,711 (Tseng et al.), and U.S. Patent No. 6,501,663 (Pan).

Appellants respectfully traverse this rejection, for the following reasons.

There are substantial, important differences between the art relied upon by the Examiner and the features set forth in the claims in issue.

Orme-Marmerilis et al., Sterett et al., Yamaguchi, Tseng et al., and Pan fail to remedy the above-discussed deficiencies of **Kudoh et al.**

Orme-Marmerilis et al., Sterett et al., Yamaguchi, Kudoh et al., Tseng et al., and Pan, alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 1: "converting the data of the coordinate system having the origin located at any position of the machine to a second set of three-dimensional data associated with a reference coordinate system provided in the construction member disposed on a transfer unit and having the origin in the construction member," in combination with the other claimed features.

Orme-Marmerilis et al., Sterett et al., Yamaguchi, Kudoh et al., Tseng et al., and Pan, alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 1: "intermittently jetting a molten metal against the construction member to define rows of metal grains so as to deposit the molten metal on a surface of the construction member to form

the electric circuit on the construction member based on the second set of three-dimensional data," in combination with the other claimed features.

Orme-Marmerilis et al., Sterett et al., Yamaguchi, Kudoh et al., Tseng et al., and Pan, alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 11: "converting the data of the coordinate system having the origin located at any position of the machine to a second set of three-dimensional data associated with a reference coordinate system provided in the construction member or on the intermediate member disposed on a transfer unit and having the origin in the member provided," in combination with the other claimed features.

Orme-Marmerilis et al., Sterett et al., Yamaguchi, Kudoh et al., Tseng et al., and Pan, alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 11: "intermittently jetting a molten metal against the construction member to define rows of metal grains so as to deposit the molten metal on a surface of the intermediate member to form the electric circuit on the surface of the intermediate member based on the second set of three-dimensional data," in combination with the other claimed features.

Appellants submit that it would not have been obvious to combine/modify the art as suggested by the Examiner to attempt to arrive at the features set forth in **claims 1 and 11**. Essential elements of a *prima facie* case of obviousness are missing.

Accordingly, in view of the above, Appellants respectfully submit that this rejection of claims 7, 8, 17, and 18 should be withdrawn by virtue of their dependency.

D. The Examiner has rejected claims 51-56 under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 6,520,402 (Orme-Marmerilis et al.), U.S. Patent No. 5,746,844 (Sterett et al.) or Japanese Patent No. 10-266803 (Yamaguchi) in view of U.S. Patent No. 4,656,048 (Kudoh et al.), U.S. Patent No. 6,309,711 (Tseng et al.), and Japanese Patent No. 11-40937 (Kuwahara et al.).

Appellants respectfully traverse this rejection, for the following reasons.

There are substantial, important differences between the art relied upon by the Examiner and the features set forth in the claims in issue.

Orme-Marmerilis et al., Sterett et al., Yamaguchi, Tseng et al., and Kuwahara et al. fail to remedy the above-discussed deficiencies of **Kudoh et al.**

Orme-Marmerilis et al., Sterett et al., Yamaguchi, Kudoh et al., Tseng et al., and Kuwahara et al., alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 1: "converting the data of the coordinate system having the origin located at any position of the machine to a second set of three-dimensional data associated with a reference coordinate system provided in the construction member disposed on a transfer unit and having the origin in the construction member," in combination with the other claimed features.

Orme-Marmerilis et al., Sterett et al., Yamaguchi, Kudoh et al., Tseng et al., and Kuwahara et al., alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 1: "intermittently jetting a molten metal against the construction member to define rows of metal grains so as to deposit the molten metal on a surface of the construction member to form the electric circuit on the construction member based on the second set of three-dimensional data," in combination with the other claimed features.

Orme-Marmerilis et al., Sterett et al., Yamaguchi, Kudoh et al., Tseng et al., and Kuwahara et al., alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 11: "converting the data of the coordinate system having the origin located at any position of the machine to a second set of three-dimensional data associated with a reference coordinate system provided in the construction member or on the intermediate member disposed on a transfer unit and having the origin in the member provided," in combination with the other claimed features.

Orme-Marmerilis et al., Sterett et al., Yamaguchi, Kudoh et al., Tseng et al., and Kuwahara et al., alone or in combination, fail to describe, teach, or suggest the following features set forth in claim 11: "intermittently jetting a molten metal against the construction member to define rows of metal grains so as to deposit the molten metal on a surface of the intermediate member to form the electric circuit on the surface of the intermediate member based on the second set of three-dimensional data," in combination with the other claimed features.

Appellants submit that it would not have been obvious to combine/modify the art as suggested by the Examiner to attempt to arrive at the features set forth in **claims 1 and 11**. Essential elements of a *prima facie* case of obviousness are missing.

Accordingly, in view of the above, Appellants respectfully submit that this rejection of claims 51-56 should be withdrawn by virtue of their dependency.

E. LEVEL OF SKILL IN THE ART

Appellants respectfully submit that the rejections of claims 1, 7, 8, 11, 17, 18, and 51-56 should be withdrawn, because of the following issues concerning a level of skill in the art.

The rejections of claims 1, 7, 8, 11, 17, 18, and 51-56 are based on what is "within the general skill of a worker in the art," which is to say within the ordinary level of skill in the art. But there are no findings, based on substantial evidence of record, regarding what is the ordinary level of skill in the pertinent art. Yet, the Federal Circuit requires that such findings be made and that they be based on substantial evidence of record.

In *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999), the Federal Circuit overturned an obviousness rejection because of its failure to make the kind of obviousness legal analysis that the Supreme Court commanded in *Graham v. John Deere Co.*, 376 U.S. 1, 17-18 (1966). Such a legal analysis must begin, the Federal Circuit has consistently held, with making specific findings of fact regarding the level of ordinary skill in the art. Thus, the *Dembiczak* decision held that an

obviousness rejection must be reversed if, like the instant rejection, it fails to contain "specific findings of fact regarding the level of ordinary skill in the art." 175 F.3d at 1000-01.

In addition, the findings that the U.S. Patent and Trademark Office makes on the ordinary level of skill must be supported by substantial evidence of record. *In re Kaplan*, 789 F.2d 1574, 1580 (Fed. Cir. 1986) ("Even if obviousness of the variation is predicated on the level of skill in the art, prior art evidence is needed to show what that level of skill was."). See also *In re Mayne*, 104 F.3d 1339, 1341 (Fed. Cir. 1997) ("The foundational facts for the prima facie case of obviousness are: ... (3) the level of ordinary skill in the art.").

Thus, the rejections of claims 1, 7, 8, 11, 17, 18, and 51-56 lack findings and analysis that the Federal Circuit considers essential to support a rejection based on ordinary skill in the art. In addition, the rejections of claims 1, 7, 8, 11, 17, 18, and 51-56 lack substantial evidence of record to support such findings, even if they had been made.

Accordingly, in view of the above, Appellants respectfully submit that the rejections of claims 1, 7, 8, 11, 17, 18, and 51-56 are improper and should be withdrawn.

F. JUSTICE

In the interest of justice and fairness, it is submitted that the rejections of claims 1, 7, 8, 11, 17, 18, and 51-56 should be withdrawn. Appellants respectfully submit that it is unjust, unfair, and improper for the Examiner to fail to discuss an amended feature.

In the Response filed April 8, 2008, claim 1 was amended to set forth, *inter alia*, “a second set of three-dimensional data” (line 12) and “second set of three dimensional data” (line 18). Claim 11 was amended to set forth, *inter alia*, “a second set of three-dimensional data” (line 13) and “second set of three-dimensional data” (line 19).

In the Advisory Action dated April 25, 2008, the Examiner states that “For purposes of appeal, the proposed amendment(s) ... [in the Response filed April 8, 2008] will be entered.”

Also, in the Advisory Action dated April 25, 2008, the Examiner states that “the request for reconsideration has been considered but does NOT place the application in condition for allowance because: see reasonings given in the Final Rejection mailed 1/8/08.”

The Examiner has not yet explained how the cited art could describe, teach, or suggest the features that were amended in the Response filed on April 8, 2008.

The Examiner has not yet adequately responded to the Response filed on April 8, 2008.

The Examiner has not yet specifically mentioned or specifically addressed the claim features that were amended by the Response filed April 8, 2008.

For example, the Examiner has not yet explicitly identified an art reference that could describe, teach, or suggest the claim features that were amended by the Response filed April 8, 2008.

Thus, the Appellants respectfully submit that the Examiner has not yet demonstrated a *prima facie* case of obviousness, regarding claims 1, 7, 8, 11, 17, 18, or 51-56.

Accordingly, in view of the above, the rejections of claims 1, 7, 8, 11, 17, 18, and 51-56 are deemed unjust and unfair. Appellants respectfully submit that the rejections of claims 1, 7, 8, 11, 17, 18, and 51-56 are improper and should be withdrawn.

In the event that this paper is not timely filed, the Appellants respectfully petition for an appropriate extension of time. The fee for any such extension may be charged to our Deposit Account No. 01-2340, along with any other additional fees which may be required now or in the future with respect to this appeal.

Respectfully submitted,

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Enclosures: Claims Appendix
Evidence Appendix
Related Proceedings Appendix

VIII. CLAIMS APPENDIX

Listing of Claims:

Claim 1 (previously presented): A method for forming an electric circuit on a construction member disposed on a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,

wherein the data is associated with a reference coordinate system provided in the machine, the origin of the coordinate system being located at any position of the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,

the method comprising the step of converting the data of the coordinate system having the origin located at any position of the machine to a second set of three-dimensional data associated with a reference coordinate system provided in the construction member disposed on a transfer unit and having the origin in the construction member,

the method further comprising the step of intermittently jetting a molten metal against the construction member to define rows of metal grains so as to deposit the molten metal on a surface of the construction member to form the electric circuit on the construction member based on the second set of three-dimensional data,

wherein the deposited metal grains overlap one another such that the electric circuit has the cross-sectional area stored in the second set of data between the two points, and

wherein the molten metal is jetted from a nozzle and both the nozzle and the construction member have X, Y, Z axes perpendicular to each other, the nozzle being movable along each of the X, Y, Z axes, the nozzle moving in a circumferential direction around each of the X axis and the Y axis, and the construction member being movable along each of the X, Y, Z axes and also in a circumferential direction around each of the X, Y, Z axes.

Claim 7 (original): The method as described in claim 1 wherein an insulator is layered on the electric circuit.

Claim 8 (previously presented): The method as described in claim 7 wherein the method comprises the step of jetting a second molten metal against the insulator to deposit the second molten metal on the insulator.

Claim 11 (previously presented): A method for forming an electric circuit on an insulating intermediate member laid on a construction member disposed on a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,

wherein the data is associated with a reference coordinate system provided in the machine, the origin of the coordinate system being located at any position of the machine, and

the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,

the method comprising the step of converting the data of the coordinate system having the origin located at any position of the machine to a second set of three-dimensional data associated with a reference coordinate system provided in the construction member or on the intermediate member disposed on a transfer unit and having the origin in the member provided,

the method comprising the step of intermittently jetting a molten metal against the construction member to define rows of metal grains so as to deposit the molten metal on a surface of the intermediate member to form the electric circuit on the surface of the intermediate member based on the second set of three-dimensional data,

wherein the deposited metal grains overlap one another such that the electric circuit has the cross-sectional area stored in the second set of data between the two points, and

wherein the molten metal is jetted from a nozzle and both the nozzle and the construction member have X, Y, Z axes perpendicular to each other, the nozzle being movable along each of the X, Y, Z axes, the nozzle moving in a circumferential direction around each of the X axis and the Y axis, and the construction member being movable along each of the X, Y, Z axes and also in a circumferential direction around each of the X, Y, Z axes.

Claim 17 (original): The method as described in claim 11 wherein an insulator is layered on the electric circuit defined on the insulating intermediate member.

Claim 18 (previously presented): The method as described in claim 17 wherein the method comprises the step of jetting a second molten metal against the insulator to deposit the second molten metal on the insulator.

Claim 51 (previously presented): The method as described in claim 1, wherein, in the step of intermittently jetting the molten metal against the construction member, an aerosol of the molten metal is jetted with compressed air against the construction member to define the electric circuit.

Claim 52 (previously presented): The method as described in claim 51, wherein, in the step of intermittently jetting the molten metal against the construction member, a mask is provided for the construction member to prevent scattering of the molten metal, the mask having a through hole which passes the molten metal to deposit it on the construction member.

Claim 53 (previously presented): The method as described in claim 1, wherein, in the step of intermittently jetting the molten metal against the construction member, a compressed gas having a temperature lower than a melting or softening temperature of the metal is jetted from a nozzle with an ultrasonic speed such that the grains of the metal are entrained in the ultrasonic speed flow of the gas in the nozzle.

Claim 54 (previously presented): The method as described in claim 11, wherein, in the step of intermittently jetting the molten metal against the intermediate member, an aerosol of the

molten metal is jetted with compressed air against the intermediate member to define the electric circuit.

Claim 55 (previously presented): The method as described in claim 54, wherein, in the step of intermittently jetting the molten metal against the intermediate member, a mask is provided for the intermediate member to prevent scattering of the molten metal, the mask having a through hole which passes the molten metal to deposit it on the intermediate member.

Claim 56 (previously presented): The method as described in claim 11, wherein, in the step of intermittently jetting the molten metal against the intermediate member, a compressed gas having a temperature lower than a melting or softening temperature of the metal is jetted from a nozzle with an ultrasonic speed such that the grains of the metal are entrained in the ultrasonic speed flow of the gas in the nozzle.

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IX. EVIDENCE APPENDIX

None.

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X. RELATED PROCEEDINGS APPENDIX

None.

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